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GENERALS HIGHWAY

~~Sequoia National Park~~ *Three Rivers vicinity*

Crossing western edge of Sequoia and Kings Canyon
national parks

Tulare County

California

HAER No. CA-140

PHOTOGRAPHS

WRITTEN HISTORICAL AND DESCRIPTIVE DATA

REDUCED COPIES OF MEASURED DRAWINGS

ADDENDUMS
FOLLOWS...

HISTORIC AMERICAN ENGINEERING RECORD

National Park Service

P.O. Box 37127

Washington, DC 20013-7127

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HISTORIC AMERICAN ENGINEERING RECORD

GENERALS HIGHWAY
~~Sequoia National Park~~ Three Rivers vicinity
HAER No. CA-140

Location: Between Ash Mountain Entrance, Giant Forest and General Grant Grove, Sequoia and Kings Canyon National Parks, Giant Forest vicinity, Tulare County, California

Date of Construction: 1921-1935

Use: Scenic park road

Principal Engineers: George Goodwin
James B. Small
W. M. Austin
Eric E. Erhart

Principal Landscape Architects: Merel Sager
Harold G. Fowler

Principal Contractors: A. J. and J. L. Fairbanks, San Francisco, California
Western Motor Transfer, Inc., Santa Barbara, California
Grunwald and Tudor, Inc. and Elbert Deffebach, Los Angeles, California
W. A. Bechtel Company, San Francisco, California
Contoules Construction Company, San Francisco, California
Gist and Bell, Arcadia, California

Owner: National Park Service, Sequoia National Park

Significance: Construction of the Generals Highway to the Giant Forest challenged engineering practices of the time. The highway and related infrastructure was designed to blend with the surrounding landscape, creating a distinctively rustic and unique park road.

Project Information:

Documentation of the Generals Highway was conducted in summer 1993 under the co-sponsorship of HABS/HAER and Sequoia National Park.

Christina Slattery, HAER Historian,
1993.

INTRODUCTION

The Generals Highway crosses the western edge of Sequoia and Kings Canyon national parks, located on the western slope of the Sierra Nevada in south-central California. The highway extends for 32.5 miles inside Sequoia National Park from the Ash Mountain entrance to the park's northern boundary and then another 13.3 miles through the Sequoia National Forest and the detached Grant Grove district of Kings Canyon National Park. The highway is joined on the southern end, at the Ash Mountain entrance, by California Highway 198 and on the northern end in Kings Canyon National Park by California Highway 180. This report focuses primarily on the Generals Highway within the boundaries of Sequoia National Park.

Construction of the highway, the principal roadway through Sequoia National Park, began in 1921 and was completed in 1935. First envisioned as an alternate road to the Giant Forest and the sequoia trees, the highway was soon extended north from the Giant Forest to General Grant National Park, now a part of Kings Canyon National Park. The Generals Highway became a one-day scenic mountain drive that connected two of the largest sequoia trees, the General Sherman Tree in Sequoia National Park and the General Grant Tree in General Grant National Park. The linking of the two "general" trees gave the highway its official name, the Generals Highway. The name was recommended by Sequoia National Park Superintendent John R. White and approved by Assistant National Park Service Director Horace M. Albright on 23 July 1923. The engineers building the road had at first called it "Halawanchi," a Monache expression for anything foolish, referring to the twisting, climbing nature of the road.

ROAD LAYOUT AND DESIGN

Park roads are constructed only where necessary, and only as necessary, to provide access for the protection, use and enjoyment of the natural, historical, cultural, and recreational resources which constitute our National Park System. National Park roadways, where they exist, are planned for leisurely sightseeing with extreme care. They are often narrow, winding, and hilly--but therein may lie their appeal.

--National Park Service Park Road Standards, 1984¹

From the founding of the National Park Service (NPS) in 1916, it has been a tenet of the agency that park roads in both design and purpose are unlike state or federal highway roads found outside park boundaries. The primary purpose of park roads has always been to provide access to parks while upholding the mission of the National Park Service to "conserve the scenery," and "to provide for the enjoyment of same in such manner and by such means as will leave them unimpaired for the enjoyment of future generations."² Park roads are not required to be the quickest and most direct route, and therefore can follow a path dictated by scenic and historic interest rather than mere topography. This policy of the National Park Service toward road construction led to the development of unique park roads that successfully blended with their environments.

A distinctive feature of park roads from the 1920s to the present is how their design and construction has been deeply influenced by landscape architects. All plans and construction proposals had to be approved by a landscape architect or "landscape engineer," as they were called at first. Under the scrutiny of these stewards of the land, park road construction followed strict guidelines in order to ensure the preservation of the natural landscape, and "as each plan was prepared, it was closely examined in the field to see how it fit the ground."³ Control was exercised throughout the road projects from initial location survey through final construction and post construction, with the landscape architects often monitoring the work in order to preserve the landscape and to open additional scenic views.

¹ National Park Service, *Park Road Standards* (Denver, CO: National Park Service, 1984), 7.

² Language adapted from the Organic Act of 25 August 1916 which created the National Park Service.

³ Linda Flint McClelland, *The Historic Landscape Design of the National Park Service 1916-1942*, draft (Washington, DC: National Park Service: 1993), 117.

Location of roads in the parks was generally motivated by the desire to select and develop the finest scenic opportunities for motorists.⁴ Restrictions on construction included limiting blasting (difficult in rocky terrain), selecting quarry and borrow sites that were not in view of the road and would not scar the landscape, regulating the careful disposal of rock and other fill materials, avoiding unnecessary cutting of trees and vegetation, and placing construction camps in areas that could easily be restored to their original state. Landscape architects were responsible for approving plans and often the actual designs for buildings, structures, bridges, culverts and signs to ensure harmony between the structures and the natural scenery. When the Bureau of Public Roads, in agreement with the National Park Service, took over control of the construction of park roads in 1926, Park Service landscape architects retained final approval for all surveys, plans, construction, and post-construction acceptance of the contracted work.

The National Park Service hired "landscape engineers" to advise on all decisions affecting the landscape within the parks.⁵ The landscape engineers created a park character that extended to all aspects of development within the parks. Today, the character defined by those early NPS landscape planners is evident in the many remaining structures and roads that exhibit a rustic and unifying park character.

GENERALS HIGHWAY

The Generals Highway, like many other national park roads, was designed to "lie lightly on the landscape." The construction of the Generals Highway up to the Giant Forest challenged the engineering practices of the time. The chosen route involved a climb of nearly a vertical mile through steep terrain and across granitic beds. The Generals Highway, in its design, construction, and roadside features remains as an excellent example of the initiative taken by NPS landscape architects to design roads and structures that meshed with the environment while providing the necessary transportation routes demanded by the automobile.

⁴ *Ibid.*, 132.

⁵ This title had been used earlier by Interior Department employee Mark Daniel, the "General Superintendent and Landscape Engineer" of the national parks. Daniel, a Los Angeles landscape architect, was in general charge of the parks before Assistant Secretary of the Interior Stephen T. Mather was named the first director of the new National Park Service.

In Sequoia National Park, the Generals Highway dramatically gains elevation and passes through a variety of vegetation zones. Beginning in the foothills, the highway is constructed on a bench cut from the north wall of the canyon of the Middle Fork of the Kaweah River and offers motorists scenic vistas of both the canyon and the river below. The road turns and winds frequently as it follows the path of the canyon. This foothill portion, from the park entrance to Hospital Rock, contains vegetation typical of the California lowland zone, dominated by blue oak, interior live oak, canyon live oak, chamise, california buckeye, and manzanita.

The next segment of the road, the switchback section, is of rather different design. This section, from Hospital Rock to Giant Forest, ascends towards the Giant Forest, climbing 3,600' in only 10.5 miles through a series of 23 major switchbacks, two S-curves, and some 200 other curves. This section winds dramatically and twists across the mountainside in order to gain the elevation needed to reach the Giant Forest. With the change in altitude the vegetation is dramatically altered as the xeric foothills are left behind for a wetter mesic forest environment. Once the road reaches the giant sequoia forest edge and enters the Giant Forest, it is characterized by more gentle winding curves. The section from Giant Forest Village to the General Sherman Tree gains little elevation and offers the driver a much easier road than the previous switchback section. Vegetation in this area is dominated by giant sequoias growing within a mixed conifer forest of pines and firs.

The road from the General Sherman Tree to the park's northern boundary again differs in character from the previous sections. This section traverses easier terrain, and as it was the last section of the road to be constructed, it followed different design standards which resulted in a wider road with gentler grades. The wide, sweeping curves of this section follow gentle ridgetops and offer occasional views of the San Joaquin Valley. The ridgetop section passes through a rich and varied conifer forest.

CREATION OF THE PARK

The land that now constitutes Sequoia National Park was of course first inhabited by Native Americans. The historic groups included the Foothill Yokuts along the lower slopes and Monache (or Western Mono) in the higher elevations up to the giant sequoia groves. In general terms, the Native Americans used the rich resources found throughout the park area for at least 3,000, and possibly 5,000 years.

By the mid-1860s pioneer cattleman Hale Tharp had settled in the Kaweah valley west of the current park. He was guided to the Giant Forest by a native group and eventually grazed some of his cattle in the upland meadows there. Tharp constructed a "cabin" in a hollow sequoia log; this cabin survives and is listed in the National Register of Historic Places. John Muir, in his exploration of the region in 1875 named "the Giant Forest" because of the large abundance and size of the sequoia trees he found there. Fifteen years after Muir wrote about the Big Trees, the campaign for their conservation began through the efforts of local Visalia newspaper writer and editor George Stewart and other concerned local citizens. Stewart, as an editor for the *Visalia Delta*, penned editorials for the protection of the neighboring mountains and forests. During his campaign, Stewart contacted California Congressman William Vandever, who had recently introduced a bill to create Yosemite National Park, and encouraged him to introduce another bill to set aside land for a Sequoia National Park. The persistence of George Stewart and others was rewarded on 9 September 1890, when Congress passed H.R. 11570 authorizing the original Sequoia National Park. The land was officially designated a public park on 25 September 1890 with the signature of President Benjamin Harrison. One week later, the size of the new park was increased by five townships with the signing on 1 October of H.R. 12187, which created Yosemite National Park and extended the territory of Sequoia National Park.

The U.S. Department of the Interior placed the protection of the new park under the supervision of the United States Army. For the next two decades, officers and troops were assigned, often from the Presidio at San Francisco, to protect the newly designated park lands. Army officers acted as superintendents of the park from 1890 until 1914, when the first civilian superintendent, Walter Fry, was appointed. The early military superintendents soon discovered that only two wagon roads entered the park: the Mineral King and Colony Mill Roads. These two roads, although steep, prone to winter washout, and narrow, would remain the primary park roads until the opening of the Generals Highway in 1926.

MINERAL KING ROAD

The Mineral King Wagon and Toll Road, built in 1879, provided an access route into the new park as it connected the foothill community of Three Rivers with the mining community of Mineral King. Ownership of the toll road transferred to Tulare County in 1885, but the county invested little money in improvements. Despite this low level of county maintenance, the federal government did nothing to improve the road after the creation of

the park.⁶ The acting superintendents and troops assigned to protect the park were often frustrated with the poor quality of this and the few other roads then available.

COLONY MILL ROAD

The Colony Mill Road, also known as the Giant Forest Road, was the second of the two early wagon roads to enter the park. Unlike the Mineral King Road, the Colony Mill route provided access to the Giant Forest area. The road was begun by the socialist Kaweah Colony in 1886 as a link to their land claims in the Giant Forest area and their nearby mill. In October of 1885, members of the Kaweah Cooperative Commonwealth of California (Kaweah Colony), a utopian commune, filed claims for land in the Giant Forest, with the hopes of logging the large trees. The construction of their road was mostly by pick and shovel, because blasting powder was too expensive to be used extensively.⁷ By 1890, the "Giant Forest Wagon and Toll Road" had been constructed for a distance of about 20 miles from the colony headquarters, located on the North Fork of the Kaweah River, to the sawmill just below the Giant Forest. The road began at an elevation of about 1,500' and rose to nearly 5,000' at the site of the mill.

Before the colonists could complete the road, however, they found themselves under unwarranted suspicion. It was eventually charged that they had not claimed the land for themselves but rather for a large land-holding company that would develop the land. As a result, the colonists' land filings were suspended until completion of the investigation. Hoping for the best, the colonists continued construction of their road, completing it in June 1890. However, shortly thereafter, with the creation of Sequoia National Park, much of their territory, including the road, became park land. In April 1891, when the Secretary of the Interior cancelled the colonists' land filings and forced the forfeiture of the Giant Forest Road, the colonists lost everything. The road they had built, however, would come to be the main artery into the park and the Giant Forest, and would remain so until the completion of the Generals Highway more than thirty years later.

A CALL FOR BETTER PARK ROADS

⁶ Herbert L. Junep, "A Chronological History of the Sequoia National Park and Vicinity," 245. MSS, 1937. Sequoia National Park Library.

⁷ *Ibid.*

The need for improved roads in Sequoia National Park was immediately obvious to the park's early managers. The Giant Forest area of the Big Trees was the most highly desirable area of the park for visitation and a road was necessary for the establishment of camps and a park headquarters in the forest. The poor road conditions were described annually by the acting superintendents in their reports to the Secretary of the Interior. In the reports, the army officers responsible for the park repeatedly requested funding for road improvements. The first acting superintendent, Capt. J. H. Dorst, wrote in his annual report for 1892: "I believe in the construction of good roads and safe trails, with easy grades, through the Sequoia Park, in order to make it easily accessible to travelers; besides the work of the park grounds could then be performed more easily and effectively."⁸ Nevertheless, in 1895, Capt. James Lockett arrived at Sequoia to find the Colony Mill Road "so washed out that it could only serve as a pack trail."⁹ The continuing lack of adequate roads in the park caused Acting Superintendent Lt. Henry B. Clark to state in his 1899 annual report, "Sequoia National Park is a failure. . . because the people find its beauties and its wonders inaccessible."¹⁰

Efforts to obtain good roads within Sequoia National Park were aided by local Visalia businessmen and citizens who had become frustrated with the lack of adequate access to the park. Improvement of park roads, the local businessmen believed, would lead to an increase in regional tourism. In 1899, serious promotion of the park began through excursions with prominent Visalia businessmen and representatives of the Southern Pacific and Santa Fe railroads. On one trip, local Congressman J. C. Needham visited Sequoia and promised action on his return to Washington, D.C. Through the requests of the acting superintendents and the help of Congressman Needham, Sequoia National Park was able to secure its first funding for improvements in 1900 under the Sundry Civil Appropriations Act. A total of \$10,000 was appropriated for the park, of which \$800 was assigned to Colony Mill Road repair with the remaining amount allotted its extension toward the Giant Forest.¹¹

The Army continued the extension of the Colony Mill Road over the next few years, as funding allowed. Finally, in August 1903 the

⁸ Annual Report of the Acting Superintendent of Sequoia National Park, 1892. Sequoia/Kings Canyon (SEKI) Archives.

⁹ Junep, 233.

¹⁰ *Ibid.*, 245.

¹¹ Annual Report of the Acting Superintendent, 1900. (SEKI Archives).

road was completed to Giant Forest and two miles beyond to Moro Rock. In celebration of the long-awaited completion of the Giant Forest Road, Capt. Charles Young, the acting superintendent and an advocate for the road, hosted a celebratory picnic for all who had been connected with its construction.¹²

Even after the completion of the new Giant Forest Road (Colony Mill Road), the annual superintendents' reports continued to express the park's need for an improved road system. In 1907, both the Mineral King and Giant Forest roads were still narrow wagon roads, woefully inadequate to accommodate the automobiles that would soon arrive in the Sierra.

In his 1912 annual report, Acting Superintendent Captain Whitman expressed the urgency for improving the park roads in order to encourage visitation:

The Sequoia Park, with all its treasures, is, however, isolated and inaccessible, due to the lack of good roads. Forty-five miles of travel up hill at a snail-like pace through stifling dust does not appeal to the modern traveler. The American public has outgrown the stage coach habit. Rapid transit by automobile or electric cars is demanded in this age. If it cannot be supplied to this park the tourist will spend his time and money elsewhere. Good roads and comfortable hotels would attract a money-spending class to these parks, while the fees collected would ultimately pay for outlay.¹³

Whitman also recommended allowing automobiles into the park, as they had just been permitted in the adjacent General Grant National Park. In the following year, 1913, automobiles were officially permitted into Sequoia National Park, on payment of an annual vehicle permit fee of \$5.00.¹⁴ The high auto permit fees were implemented to raise funds for road improvements. Drivers on the Giant Forest Road were asked to obey the following rules and restrictions:

- Automobiles must pull over for horse teams
- 6 mph speed limit on curves and 15 mph on the straightaways
- Motors must stop when teams approach

¹² Captain Young, an African-American, refused to eat with his guests because of his color and chose instead to wait on tables and eat with his men and the cooks. (Junep, 267).

¹³ Annual Report of the Acting Superintendent, 1912. (SEKI Archives).

¹⁴ Annual Report of Acting Superintendent, 1913 and 1914. (SEKI Archives).

- Signal with horn at or near every bend to announce to teams proximity of the motors.
- Teams have the right of way.¹⁵

As traffic on the road increased, further restrictions were instituted, and the road was converted to a one-way single lane route. Traffic was allowed to leave Kaweah, near the park boundary, for the Giant Forest only from the hours of 4 a.m. to 1 p.m. and cars were allowed to exit the Forest only from 3 to 5 p.m. The introduction of automobiles to the park hastened the need for other road improvements.

MOUNT WHITNEY POWER COMPANY (ELK PARK) ROAD

The Mount Whitney Power Company Road, or Elk Park Road, was the third road to enter the park prior to the construction of the Generals Highway. The Mount Whitney Power Company was granted a right of way, by contract with the Department of the Interior on 25 February 1907, allowing for the construction of flumes, ditches, etc. within the park.¹⁶ In order to construct its #3 Flume, the power company needed access up the Middle Fork Canyon to Hospital Rock and applied to the park to construct a \$25,000 wagon road along the right of way.¹⁷

Construction began slowly in 1907 using a small crew of two men. In anticipation of using the proposed road to Hospital Rock as an alternative route to Giant Forest, Capt. C. C. Smith, the acting park superintendent, suggested that a road be built down from Giant Forest to connect with the Mount Whitney Power Company Road. The "Smith Grade," begun in 1909, was to extend from Camp Sequoia in the Giant Forest down into the canyons below to join with the Mount Whitney Power Company Road near Power Camp #3 at Hospital Rock.¹⁸ The Smith Grade was only completed from Camp Sequoia at Commissary Curve to Eleven Range Point, however, before construction was discontinued. The construction of the Smith Grade and the Mount Whitney Power Company Road increased the number of roads in Sequoia and both roads would later be incorporated into the Generals Highway.

¹⁵ Annual Report of the Acting Superintendent, 1914. (SEKI Archives).

¹⁶ Annual Report of the Acting Superintendent, 1908, 14. (SEKI Archives).

¹⁷ The power company also built a wagon road along the north edge of the Giant Forest for access to Wolverton Creek.

¹⁸ Annual Report of the Acting Superintendent, 1909, 12 (SEKI Archives); Junep, 283-84.

"ON TO GRANT"

The idea of a road to General Grant from Giant Forest was mentioned in the annual superintendents' reports as early as 1901, when the extension to Giant Forest from the Colony Mill was underway. However, the work was not begun until 1918 when construction commenced on what was intended to be the Sequoia - General Grant Road. The proposed road was to provide access to many campsites in the area for park visitors. By June 1919, it had been constructed for 2 miles between Wolverton and the Marble Fork River at what later came to be called Lodgepole Camp. This extension of the Giant Forest Road incorporated about 6 miles of wagon road built by the Mount Whitney Power Company between Giant Forest Village and Wolverton, where the power company had intended to build a reservoir. In the planning phase for the road, the Park Service also received approval from the U.S. Forest Service in 1922 to construct a road across Forest Service land which lay between the two parks. All this activity was made possible when Congress began giving the new National Park Service small sums for park improvements. It was the policy of the agency's first director, Stephen T. Mather, to use these funds to complete park roads and then to allocate smaller amounts to trails and footpaths. The construction of a highway to General Grant National Park was consistent with the national agenda set by the National Park Service, and the policy of "on to Grant" was adopted.

PARK TO PARK HIGHWAY

Another factor in the decision to build modern roads in the park resulted from the Park to Park Highway movement. The Park to Park Highway Association was formed to "encourage the construction of at least one good road connecting each of the twelve national parks in the Rocky Mountains and the Pacific coast regions."¹⁹ Sequoia and General Grant were important links in this chain. The association, with the support of the National Park Service, the National Highway Association, and the American Automobile Association, promoted the construction of a connecting highway using their influence with federal and state agencies to popularize the national parks and to secure additional funds for road construction within the parks. The association also promoted the development of roads across U.S. Forest Service lands and the development of roads on Indian reservations.

Organized in 1916 and incorporated in 1920, the Park to Park Highway Association promoted the motto "You sing America - Why not see it?" The first official auto tour to promote and dedicate the Park to Park Highway took place from in fall 1920.

¹⁹ Park to Park Highway Association Brochure, 1920. (SEKI Archives).

The purpose of the tour was to focus attention on the need for a road connecting the nation's western parks. The association designated a route, assisted agencies in road projects, and solicited federal, state and county governments for aid. Both Sequoia National Park and local citizen groups were involved with the Park to Park Highway Association. Superintendent John Roberts White attended a local meeting of the association in Visalia and a representative from Visalia was chosen to attend the first annual national conference in Denver in 1920. A road to connect Sequoia National Park and General Grant National Park would become a link of this park to park highway system, and the association supported the connection of the two parks.

BEGINNINGS OF THE GENERALS HIGHWAY

Park Service Director Mather undertook the task of promoting the national parks as one of his primary objectives. Mather recognized the need to increase and improve the number of roads within the parks in order to increase visitor support for the parks. On a visit to Sequoia in 1918, Mather inspected poor conditions on the existing Giant Forest (Colony Mill) Road and immediately ordered the survey for an additional road. His recommendation for a new road was a part of his national agenda to increase park accessibility.

The pressure for improved park roads also increased with the construction of a state highway from Lemon Cove to Three Rivers. Completed in 1918 to Three Rivers, the state highway reached the park boundary on 12 January 1924. The new concrete highway to the park boundary was touted as "an additional inducement to the motoring public for trips to the park."²⁰ The decision to construct the route within Sequoia National Park was the culmination of poor existing road conditions, the increased use of the Giant Forest Road, and the influence of park officials and visitors, local residents, and Director Mather.

THE PETERS SURVEY

The "Peters survey," ordered by Director Mather, was completed in 1919 and bids for construction were sought. A contractor from Fresno offered to undertake the job, which was estimated to cost \$300,000. Little funding for park roads was available nationally and without the necessary appropriation, the road project would be delayed for a few years. Mather was able to authorize \$3,000 for improvements on the portion of the Middle Fork Road that had been constructed by the Mount Whitney Power Company, but he recommended that further construction work should be delayed on

²⁰ June, 317.

the extension of the road until sufficient funds were available to finance its entire construction.

The original plan for the new highway to Giant Forest was for it to supplement the existing but inadequate Giant Forest (Colony Mill) Road. The new road would connect the existing Mount Whitney Power Company route to Hospital Rock with the Giant Forest by way of Deer Ridge. This road would serve as a one-way route into the park, with the Colony Mill road serving as the exit for outgoing traffic. The superintendent's annual report for 1920 stated that "...when completed the Middle Fork Road will be the 'Front Door' to the Sequoia National Park and the Giant Forest Road will be the 'Back Door;' both areas necessary to the Park as to a residence. When both roads are completed a system of one-way traffic will make it possible to travel faster and with less risk."²¹

Outside support for the road was obtained early in 1920 through the efforts of men like Ben Maddox, owner of a Visalia newspaper, who had encouraged congressmen, including the chair of the Appropriations Committee, to visit Giant Forest. During the visit, Maddox promoted the beauty of Giant Forest and the necessity of making the area more accessible, emphasizing what the county had done by providing roads to the park.²² Largely through Maddox's efforts, appropriations would later be made for the construction of the Generals Highway.

The best route for the new road had still not been determined. In 1920, discussions began about the possible advantages of a new route that would reach the Giant Forest traveling east of Moro Rock up the Middle Fork Canyon to Panther Creek and then northwest back to the Giant Forest plateau near Log Meadow. A survey for this new route was projected to cost \$700.²³ Support for this new route was strong as Mather and many local citizens favored it over the Peters route. NPS Chief Civil Engineer George Goodwin was asked to appraise the two routes. Goodwin recommended the route to the west of Moro Rock, following the Peters survey, to Mather in April 1921. Goodwin maintained the route would be more economical to construct.

Mather accepted Goodwin's recommendation, and in an effort to eliminate further controversy over placement of the road suggested that Goodwin review the situation on the ground with a

²¹ Annual Report of the Superintendent, 1920, 6. (SEKI Archives).

²² Ben Maddox to H. E. Barbour, 8 September 1920. (SEKI Archives).

²³ Superintendent's Monthly Report, October 1920. (SEKI Archives).

representative of the State Highway Commission, Superintendent White, Ben Maddox, and additional interested parties. In July 1921, Goodwin advised his assistant engineer, Victor A. Endersby, to begin a location survey of the Peters route, beginning at Hospital Rock and continuing to Giant Forest. The proposed new one-way section was to include a 9' travel lane and 3' ditches, an average grade of 6-8 percent with a 10 percent maximum, and 50' minimum radius curves.²⁴ Goodwin also instructed Endersby to evaluate the roadway for possible widening to 20', as had been done at Mount Rainier National Park. Goodwin arrived in Sequoia in August to evaluate the location survey, and after looking over Endersby's work concluded that the best location for the road still was west of Moro Rock, connecting onto the existing Smith Grade at its upper end, and then utilizing 2 miles of the existing Giant Forest Road. The survey was completed nearly to Deer Ridge by September, when NPS assistant engineer W. W. Crosby succeeded Endersby. Crosby completed the survey to Giant Forest in November.²⁵

Although Goodwin and Mather both supported the route to the west of Moro Rock, it remained controversial. In March, 1922, Goodwin wrote Mather:

Because of the many erroneous opinions which had been expressed by certain people connected directly or indirectly with the Park, and by residents of that vicinity, as to the impracticability and undesirability of a route somewhat along the line of our reconnaissance survey between Hospital Rock and Giant Forest; and because it had been emphatically stated by some of these same people that the only feasible route was up the Middle Fork to Panther Creek and then back to the rim of the Canyon just east of Moro Rock, or just east of Crescent Meadows, I saw fit to request the two best qualified agencies. . . to detail two competent and experienced engineers to go over and consider in general way the different possible routes and to give me a report of their findings thereon.²⁶

In April 1922, Walter N. Frickstadt, Senior Highway Engineer of the Bureau of Public Roads (BPR), and W. Lewis Clark, Assistant Chief Highway Engineer of the California Highway Commission, came to Sequoia to examine the possible routes between Hospital Rock

²⁴ George Goodwin, Chief Civil Engineer, National Park Service, to Victor A. Endersby, NPS Assistant Engineer, 23 July 1921. (SEKI Archives).

²⁵ Superintendent's Monthly Report, September 1921. (SEKI Archives).

²⁶ Goodwin to Stephen T. Mather, Director, National Park Service, 31 March 1922. (SEKI Archives).

and Giant Forest. Their evaluation of six different routes substantiated the findings of both Goodwin and the Peters survey, and they recommended the route west of Moro Rock via Deer Ridge. This route promised to be the most economical and practical at an estimated cost of \$200,000.²⁷ Final construction survey reports for the road were completed in April 1922 and received the approval of the Bureau of Public Roads, the California Highway Commission, and George Goodwin.

CONSTRUCTION

Construction of the Generals Highway began at Hospital Rock in July 1921 even before the route to Giant Forest had been finalized, when Sequoia National Park secured an appropriation of \$50,000.²⁸ Construction of the new road was a slow process because the funds allocated were small, allowing only for short sections to be completed at a time.²⁹ Construction was supervised by the engineering and landscape engineering divisions of the National Park Service and the park superintendent, who was responsible for administrative details relating to construction. National Park Service engineer James B. Small served as the foreman for the project from July 1921 to April 1925, serving under Goodwin. Small had transferred from the engineering department at Yellowstone National Park, where he had been a road foreman.³⁰ Crews established a construction camp for the Sequoia project at Hospital Rock and the work pushed forward from that spot. The first mile of road from Hospital Rock was graded and cleared by hand drilling and blasting by September 1921. Construction proceeded at a faster rate once an air compressor, drills, and steam shovel were placed in use in November.

In 1922, another \$50,000 was appropriated for road construction leading to the completion of a 3-mile with a 6 percent grade from Hospital Rock. The construction of the switchbacks was a real challenge. In one section, the original plans had suggested a sidehill bridge in the canyon, but instead Foreman Small constructed a switchback through solid rock, eliminating the need for the bridge.³¹ Construction of the switchback section was slow because of the cutting required through solid rock, and

²⁷ Goodwin to Mather. 31 March 1922, 2. (SEKI Archives).

²⁸ Junep, 325.

²⁹ The funds allocated for 1922 - \$50,000; 1923 - \$37,500; 1924 - \$54,000. John R. White, Superintendent, Sequoia National Park, to Mather, 14 November 1923. (SEKI Archives).

³⁰ Junep, 326.

³¹ Superintendent's Monthly Report, April 1924. (SEKI Archives).

continuous break-down of the steam shovel caused other delays. Nevertheless, the new road was already becoming a prominent feature from Moro Rock, as Superintendent White described in his monthly report for May 1922:

From the summit of Moro Rock the road will be unrolled like a brown ribbon against the grassy slopes of Switchback Mountain and the brush and forest-clad buttresses of Moro Rock. It is doubted whether in any other park or part of the country the full length of an approach road from the valley to the high mountains will be as plainly seen as will the Middle Fork Road from Moro Rock. It is not difficult to foresee the day when one of the chief attractions of Giant Forest will be the view of the road and the automobiles climbing up from Hospital Rock.³²

Plans called for the new road to connect at its upper end with the existing "Smith Grade" until a new grade point could be constructed to replace the old military route. This new road was never constructed, however, and the "Smith Grade" from Commissary Curve to Eleven Range point still serves as a section of the Generals Highway to Giant Forest Village.

By August 1924, the construction had been completed to within 3 miles of the lower end of the Smith Grade. Meanwhile, the Smith Grade was being prepared for its connection with the new road from below by being widened, and a turnout was constructed at its end. Construction shut down for the winter, and resumed in March 1925. The work was delayed by both equipment failure and the winter shutdown, and a connection between the two roads was not made until 25 July 1925. Construction costs between 1922 and 1925 totalled \$154,530.³³

The continued construction of the Generals Highway, as the new route was known after 1923, was aided by the passage of a bill by Congress on 9 April 1924, authorizing the Secretary of the Interior to construct, reconstruct, and improve roads and trails in the national parks. The bill allocated funding for the following three years.

The three-year appropriation helped fund the completion of the Generals Highway, but the work was not without obstacles. The existing Mount Whitney Power Company Road from the park boundary

³² Superintendent's Monthly Report, May 1922. (SEKI Archives).

³³ Superintendent's Monthly Report, November 1924. (SEKI Archives).

to Hospital Rock had been neglected and had fallen into disrepair, thus additional funding was needed for improvements and maintenance. Goodwin's estimates for improvements below Hospital Rock were less than \$12,000 per mile for the 6.9 miles. The entire section would require \$110,800 with a concrete bridge over the Marble Fork. or \$10,000 less if a timber bridge was employed.³⁴ Improvements to the existing road from the park entrance were begun, and by January 1924 the Middle Fork Road had been graded and repaired as far as Hospital Rock.

Another issue to be resolved was the fact that the roadway above Hospital Rock had been design for one-way use; vehicles left the park over the Colony Mill Road. A visit in May 1923 from the Chair of the House Appropriations Subcommittee led to the decision to make the new road a two-lane highway, which would eventually reduce maintenance costs because it would not be necessary to maintain the old Giant Forest (Colony Mill) Road to the same standard.³⁵

Superintendent White observed that the widening of the Hospital Rock--Giant Forest section of road, constructed under the supervision of Goodwin and Small, was practically a complete reconstruction in areas, due to the change in the roadway width. One of the team foremen described the existing road more as a trail than a road and stated to Colonel White: "they built a mighty good trail up the mountain."³⁶ Improvements to the road were numerous as it needed to be cut back to twice its width in sections in order to achieve a reasonable radius on curves.³⁷

Funding for the widening came at the expense of the Wawona Road project [HAER No. CA-148] in Yosemite National Park, from which money was taken to support the roads and trails in Sequoia. Director Mather personally reallocated the \$50,000 to continue work on the Generals Highway.

Superintendent White commented in his October 1925 monthly report:

Every time I go over the road I am amazed at the amount of widening and improvement work to be done on the grade roughly built as one way road before the change in

³⁴ Superintendent's Monthly Report, June 1922. (SEKI Archives).

³⁵ Dilsaver, Lary M. and William C. Tweed. *Challenge of the Big Trees: A Resource History of Sequoia and Kings Canyon National Parks* (Three Rivers, CA: Sequoia Natural History Association, Inc. 1990), 126.

³⁶ Superintendent's Monthly Report, November 1925, 6. (SEKI Archives).

³⁷ *Ibid.*

Engineering Division last spring. Even from Big Fern Camp to Deer Ridge which was constructed subsequent to the visit of Mr. Cramton and Congressional party in May 1923 (when authority was given to double width of road) construction is so narrow and unfinished that a vast amount of work remains to be done to bring road up to modern standards for a mountain auto road.³⁸

Improvement of the road above Hospital Rock continued under the 1925 appropriation, as did the reconstruction of the road below Hospital Rock. During that year the road to Hospital Rock was oiled, with additional improvements to the road including the placement of radiator filling stations at every available spring along the Generals Highway between Hospital Rock and Giant Forest, including Big Fern, Granite, Slide, Moss and Wall springs.

The state, as noted, was simultaneously improving the highway approaching the park, widening tight-radius curves and eliminating blind curves. Standards for the state highway were quite high and the park was challenged to provide a road of similar grade, alignment, and safety within its boundaries on similar terrain. Before the Generals Highway could be considered completed, a section from the new state highway to the newly designated park headquarters at Ash Mountain had to be constructed. The new state highway, still under construction, would reach only to a point half a mile from the park boundary. To fill the gap, plans were immediately prepared for a road. The connection of the park road to the new state highway was completed by May 1925 as a double-width standard dirt road, providing, according to Superintendent White "the only boulevard in the park."³⁹

The construction of the Generals Highway, under the supervision of engineer Small, enabled the highway to be built at a reasonable cost while protecting the natural resources and features of the park. Superintendent White discussed Small's contributions to the highway construction: "I have seen so much devastation in connection with road building in the last two or three years that Mr. Small's work was a revelation in what can be done with care and judgment and should be an example to others

³⁸ Superintendent's Monthly Report, October 1925, 5. (SEKI Archives).

³⁹ Superintendent's Monthly Report, May 1925. (SEKI Archives).

who are building roads through scenic mountain areas."⁴⁰ He added, "It is no exaggeration to say that only the intelligent work of General Foreman Small has made it possible to build this mountain road within appropriations."⁴¹

Director Mather also was impressed with the way Small had handled the road construction, especially the preservation of the grove of cedars surrounding Big Fern Spring, located halfway between Hospital Rock and Deer Ridge.⁴² Small, in poor health, was replaced with regret in March 1925 by a new foreman, Johnston.

DEDICATION

The Generals Highway to Giant Forest was formally dedicated on 5 September 1925 by Director Mather. A representative group of California civic officials assembled at the park entrance for the ceremony. Mather professed that the Generals Highway was "the best road in any National Park yet."⁴³ Superintendent White had similar thoughts, observing, "In the 36-year history of the park no events equal in importance to the [proposed] park enlargement and the completion of the Generals Highway have occurred."⁴⁴

The road was not completed at the time of the dedication and only remained open through the Labor Day weekend. Following the dedication, work continued, including the placement of natural boulders at curves and fills along the roadside to define the road edge.

The Generals Highway to Giant Forest was permanently opened to the public in July 1926. The new road shortened the travel time to the Giant Forest, placing it within 2 hours of Visalia and 3 hours of Fresno. The opening of the highway increased the number of visitors to the Giant Forest, with a record 23,465 autos traveling the new road that summer. The construction was praised because there were no accidents on the unfinished road despite the fact that it did not have curbs, guardrails, or fences on its steep sidehills.

⁴⁰ Statement by Superintendent White from the Seventh Annual Report of National Park Service. "Seventh Annual Report of National Park Service, 1923," 68.

⁴¹ Superintendent's Annual Report, 1923, 14. (SEKI Archives).

⁴² Arno Cammerer, Assistant Director, National Park Service to White, 31 March 1923. (SEKI Archives).

⁴³ Superintendent's Monthly Report, September 1925. (SEKI Archives).

⁴⁴ "The Year in the Parks," draft entry for the Director's Report, 1926, 1. (SEKI Archives).

Work continued sporadically on the roadway for the next several years. The final completion of the highway was hindered by a lack of funds, diversion of crews to highway clearing projects, and the failure of equipment. Nature added its own special challenge; heavy winter rains in February 1927 caused 43 landslides on the new highway in less than 8 miles, and the estimated repair cost was \$12,000.⁴⁵ Finally, in 1929, with most work completed, the highway remained open for the first time year round.

SWITCHBACK CONTROVERSY

Even after the road opened in 1926, debate continued as to whether it would be the permanent road to the Giant Forest. The section of the Generals Highway between Hospital Rock and Giant Forest contained numerous switchbacks with very tight turns. A movement arose in 1931 to replace the switchback section with a new route east of Moro Rock through the Crescent Meadow, and the Visalia Chamber of Commerce passed a resolution urging the construction of the alternative. The proposal would replace the switchback section from Hospital Rock to Giant Forest with a better grade.

A reconnaissance survey for the replacement project was completed by W. R. Weber of the NPS Branch of Plans and Design on 20 May 1933, and branch chief Thomas C. Vint supported the new location. Superintendent White stood in strong opposition, citing the fact that the existing road had been accommodating sufficient traffic, about 2,000 cars a day, with very few accidents.⁴⁶ White was of the opinion that only minor improvements to the road were necessary to bring it up to standard. Through correspondence with members of the Sierra Club, White kept that group informed of the plans and proposals for a new road and gained their support in his opposition. Sierra Club members wrote new NPS Director Arno B. Cammerer opposing plans for a new road. The Sierra Club favored the improvement of both the existing Middle Fork route and the Colony Mill route as an alternative to constructing more roads through the wilderness. White also gained support from former Park Service Director Horace M. Albright, who visited Sequoia in 1934 and then wrote his successor, Cammerer:

The road is now an exceptionally good mountain highway and with additional improvements in the way of widening

⁴⁵ Superintendent's Monthly Report, February 1927. (SEKI Archives).

⁴⁶ White to Thomas C. Vint, Chief, Landscape Architecture Division, National Park Service, 13 December 1933, 107-24. (SEKI Archives).

of some curves, some more parapets and permanent surfacing, this present road can and in my judgement should become a part of the permanent highway system of Sequoia National Park. . . . The time will soon come when a road like the switchback section of the Generals Highway will be extremely unique. People will come to the Park to travel over this road because of its interest. It is and always has been a most interesting and spectacular highway.⁴⁷

Earlier, Albright had called the road from Hospital Rock to Giant Forest a "rat hole."⁴⁸ Albright was disturbed that money was continually expended for its repairs. NPS Chief Civil Engineer Frank Kittredge was surprised at the change in Albright's attitude and agreed with the Bureau of Public Roads that a new road would eventually have to be built to replace the existing route. Kittredge suggested that the proper placement of guardrails, parapet walls, paving, gutters and drainage would be sufficient for the short run. In August 1934, Superintendent White and BPR engineer Levant Brown agreed that the relocation or improvement of the Generals Highway between Ash Mountain and Hospital Rock would no longer be considered an active need, but that the issue would be reviewed at some future date. This decision confirmed that the switchback section would remain in use with additional parapet work and improvements. White felt that following the completion of these improvements the road could be considered a permanent road. In 1938, Albright wrote White that, "After the road was completed I loved it, and hope it will never be replaced by a modern highway."⁴⁹

BUREAU OF PUBLIC ROADS INVOLVEMENT

In 1926, the National Park Service and the Bureau of Public Roads (BPR) an agency of the United States Department of Agriculture, signed a joint agreement for the survey, construction, and improvement of roads and trails within national parks and monuments. The agreement, signed on 18 January 1926, stipulated that the Park Service would utilize the existing and established services of the road building agency of the Bureau of Public Roads for the improvement of roads in the interest of economy and efficiency. Under the agreement, the BPR prepared surveys, advertised construction bids, supervised construction, and inspected the projects, filing final reports for each contract.

⁴⁷ Horace M. Albright to Cammerer, 2 July 1934. (SEKI Archives).

⁴⁸ White to Cammerer, 21 May 1934. (SEKI Archives).

⁴⁹ Albright to White, 9 March 1938. (SEKI Archives).

Although the BPR was in charge of construction, NPS landscape architects and park superintendents retained final approval of all projects ensuring that Park Service standards were upheld. NPS landscape architect Merel Sager monitored all road construction in Sequoia National Park.⁵⁰

Formal BPR involvement in Sequoia began in 1926 after the completion of the Generals Highway to Giant Forest. The BPR, under the direction of District Engineer C. H. Sweetser, took the lead in the construction of the highway north from Giant Forest to General Grant National Park. The BPR also assumed responsibility for improvements to the existing road, including paving the entire highway.

Mostly, the BPR focused on the extension of the highway toward General Grant National Park. The Bureau completed the surveys, estimates, and designs in conjunction with the National Park Service landscape architects for both the highway and related bridges and drainage structures. The Bureau oversaw the construction of the highway section by section. The road was completed to Lodgepole, 4 miles north and east of Giant Forest, in 1930, and with the construction of the Lodgepole and Clover Creek bridges the work continued on to the north towards Lost Grove near the park's northern boundary.

The agreement between the BPR and the NPS led to a new era of road construction in the national parks. A major change at Sequoia was the adoption and the utilization of "Forest Highway Standards" for road construction. The 1926 standard called for a road surface 18' wide, with a maximum grade of 6 percent, and a minimum curve radius of 300'. Roads constructed in Sequoia prior to BPR involvement had not met these standards. The Peters Survey had outlined a road of 12' (single lane) and a grade of 6-8 percent, with a maximum of 10 percent. As improvements were done on existing portions of the road, the BPR sought to apply the new standards to the existing roads whenever feasible. On new road work, the standards were strictly enforced. Over the next several years, the standards were strengthened. By 1932 the standard called for a road width of 26' with a maximum 6 percent grade and a minimum radius curvature of 300'. The change in standards during the construction of the highway altered both the road width and turning radius, and resulted in a variety of driving experiences for park motorists.

The first road improvement project executed by the BPR in Sequoia was the replacement of the road from the park entrance to the park headquarters, a distance of 0.76 miles. A preliminary

⁵⁰ Superintendent's Annual Report, 1931, 21. (SEKI Archives).

survey was completed for this section in the winter of 1926-1927, and designs were prepared based on the 1926 Forest Highway Standard. The project was carried out by day labor from February 1928 through August 1929 under the supervision of BPR engineer W. M. Austin in the first season and engineer Eric E. Erhart the following season. The road was relocated, with special attention paid to the construction of culverts and box culverts with cement rubble masonry headwalls to provide proper drainage beneath the road. After the construction of the new road, a line of large boulders (border stones) was placed along the shoulder of the road to act as a rustic guardrail following a suggestion made by Superintendent White.⁵¹

Contracts for improvement of the highway from Hospital Rock to Giant Forest were completed in both 1931 and 1932. The first contract, supervised by Erhart, included grading and subgrade reinforcement of portions of the highway. A survey had been completed in 1929 for this work to correct grades which had been constructed as steep as 9 percent and curves in the switchback section with radii less than 30'. The contract called for flattening and widening curves where the sight distance was short, using the 1929 Forest Highway Standard of an 18' roadbed and a minimum radius of curvature of 40'. Without the complete reconstruction of the road, this was the best improvement possible. The last 2 miles reaching the Giant Forest still retained a narrower roadbed than the lower section of the road, and the offending section was widened in the same contract. The contractor for the project was A. J. and J. L. Fairbanks of San Francisco, California, who satisfactorily completed the project on 11 June 1931. Masonry work at Deer Ridge, including a wall and hand-laid embankment, had been subcontracted, as had sections of stone guardrail. Altogether, the project widened 4.51 miles of road, and reinforced another 4.11 miles.⁵²

Immediately following the 1930-1931 improvements, additional sections of the road from Hospital Rock to Giant Forest underwent similar improvements under another contract. The design called for the grading and subgrade reinforcement of 10.585 miles loosely following the 1929 Forest Highway Standard, with a minimum curve radius of 40' and no major changes in road grade. The contract was awarded to the lowest bidder, Western Motor

⁵¹ Eric E. Erhart, Chief Engineer Inspector Foreman/Superintendent, Bureau of Public Roads, *Final Construction Report on Generals Highway, Sequoia National Park, Route No. 1, Section A1, Tulare County, California, 1930* (San Francisco, CA: Bureau of Public Roads, 1930), 7.

⁵² Idem, *Final Construction Report, Sequoia Project 1B, Hospital Rock - Giant Forest Improvement, Generals Highway, Sequoia National Park, Route No. 1, Tulare County, California, August 1931* (San Francisco, CA: Bureau of Public Roads), 1-15.

Transfer, Inc., of Santa Barbara, California, in June 1932. The contractor widened many sections of the road and used crushed rock for the subgrade reinforcement, followed by an oiling of the entire section. Masonry work for this segment was subcontracted to the firm of Kelly and Tipton, which was also doing stone work in Yosemite National Park. The stone work in Sequoia included masonry retaining walls and hand-laid rock embankments and parapet walls, with the majority of the stone coming from a quarry at Granite Spring. In this section post and cable guardrails were also erected; these were constructed of creosote-treated Douglas fir posts strung with wire rope. The second phase of improvements package to the switchback section of the Generals Highway was completed in November at a final cost of \$89,125.58.⁵³

EXTENSION OF THE ROAD TOWARDS THE GENERAL GRANT TREE

The dream of the roadway connecting Sequoia and General Grant National Parks had never died. By 1926, with the new highway to Giant Forest open, and with adequate annual appropriations available from Congress, the dream could at last be realized. Superintendent White saw what this road project would eventually mean, stating "the two parks will be virtually one park as the fine highway between them may easily be driven in less than an hour."⁵⁴ The estimated cost for the new road from Giant Forest to the Grant Grove was \$387,500.⁵⁵

The northward extension of the Generals Highway began in 1926 with the construction of the highway from the Giant Forest to the General Sherman Tree. This section, which was designed to meet the 1926 Forest Highway Standard, was built by day labor under the supervision of the Bureau of Public Roads. Construction continued from the General Sherman Tree to Lodgepole in 1928. This 2.25-mile section was also designed according to the 1926 Forest Highway Standard; it was constructed under contract by Grunwald and Tudor, Inc., and Elbert Deffebach of Los Angeles. The section had a maximum grade of 5.2 percent and was surfaced

⁵³ Idem, *Final Construction Report on Sequoia Project 1-B, Improvement of the Hospital Rock - Giant Forest Section, Generals Highway, Sequoia National Park, California, 1933* (San Francisco, CA: Bureau of Public Roads, 1933), 1-14.

⁵⁴ Annual Report of the Superintendent, 1932, 2. (SEKI Archives).

⁵⁵ Jim Corson, "A Brief History of the Generals Highway," MSS, n.d. (SEKI Archives), 2.

with decomposed granite. Construction was completed on 29 October 1928 at a cost of \$59,106.72.⁵⁶

Wolverton Creek was located along the section of road between the General Sherman Tree and Lodgepole, and in 1928-29 a culvert was constructed across the creek. The culvert, designed by the BPR and built by day labor, was a 10' x 10' x 70', reinforced concrete slab top structure with cement rubble masonry sidewalls. Construction of the culvert began in September 1928 and was completed the following October at a cost of \$12,875.29.⁵⁷

From Lodgepole, the next 2.25 miles of road was completed under contract in August 1929. The section had been surveyed by the BPR in 1926, and designs and plans were prepared according to the 1926 Forest Highway Standard. The contract was awarded to Grunwald and Tudor, Inc., and Elbert Deffebach, who were completing the adjoining section of road. The contractors encountered financial difficulties related to the alleged mismanagement of the project and arrangements were made with the W. A. Bechtel Co. of San Francisco to complete the work. The original contract included the construction of the Clover Creek Bridge, but this structure was transferred to a contract which included the nearby Lodgepole and Silliman Creek water crossings. The extension of the highway beyond this section was delayed until the completion of the Lodgepole and Clover Creek bridges and the Silliman Creek "bridge" (technically a culvert).

The Bechtel Company constructed the three structures under one contract during 1930 and 1931. The structural design was handled by BPR engineers, and Park Service landscape architect John B. Wosky designed the stone facade. Both the Lodgepole (also known as the Marble Fork) and the Clover Creek bridges were designed to complement the visual environment. The designs specified reinforced concrete arches with self-supporting stone masonry arch rings. The two bridges, similar in design, vary in both size and setting. The Lodgepole Bridge spans 45' over the Marble Fork of the Kaweah River, and the forested setting largely obscures the bridge from the view of passing motorists. In contrast, the Clover Creek Bridge spans a distance twice as long,

⁵⁶ W. M. Austin, Associate Highway Engineer, Bureau of Public Roads, *Final Construction Report (1928) on Sherman Tree - Lodgepole Section of the Generals Highway, Sequoia National Park, Route No. 1, Tulare County, California* (San Francisco, CA: 1928), 1-7.

⁵⁷ Erhart, *Final Construction Report (1928-1929) on Wolverton Creek Culvert (Sequoia 1C2 D.L. Structure), Sequoia National Park, Route No. 1, Section C2, Tulare County, California* (San Francisco, CA: Bureau of Public Roads), 1-6.

90', across the granite canyon of Clover Creek. The Silliman Creek culvert is a reinforced concrete slab structure on rubble masonry abutments and spans a distance of 16'.⁵⁸

By 1930, all but about 10 miles of the Generals Highway had been constructed within the Sequoia boundaries. The Halstead Meadow section north of Lodgepole to Suwanee Creek was constructed in 1930 and 1931 to the 1929 Forest Highway Standard, and extended the highway another 2.7 miles closer to the ultimate goal of General Grant National Park. The contractor for this section was the W. A. Bechtel Company, the same company that had served as contractor for the three stone and concrete structures. The Halstead section contained the Suwanee Creek culvert, which Bechtel subcontracted to A. Pernu. The Suwanee culvert is unique to the park because it is a continuous stone arch throughout. The stone used was quarried from nearby granite outcrops. The contract was completed in October 1931 at a final construction cost of \$196,466.64.⁵⁹

In 1932 construction commenced on the 3.097-mile Little Baldy Section, which ran from Suwanee Creek to a point one mile south of Dorst Creek. Three surveys were completed for this section, in 1926, 1928 and 1931. The final survey eliminated the switchbacks of the earlier designs and secured a better road alignment. The final design and estimates were completed in 1932 and adhered to the new 1932 Forest Highway Standard, having a roadway width of 26', maximum grade of 6 percent, and a minimum radius curvature of 220'. This section included hand-placed rock embankment and stone masonry headwalls for the smaller pipe culverts. The contractor, the Contoules Construction Company of San Francisco, completed the project on 21 October 1933 at a final cost of \$157,706.20.⁶⁰

The last section of the Generals Highway in Sequoia National Park, extending from just south of Dorst Creek to the northwest boundary, a distance of about 3.5 miles, was completed on 26 October 1933. This section was also completed according to

⁵⁸ Erhart, *Final Construction Report on the Lodgepole, Silliman and Clover Creek Bridges, Route No. 1, Generals Highway, Sequoia 1-C2, D1, Sequoia National Park, Tulare County, California, 1930-1931* (San Francisco, CA: Bureau of Public Roads, 1931), 1-15. The Lodgepole and Clover Creek bridges were listed in the National Register of Historic Places in September 1978.

⁵⁹ Idem, *Final Construction Report, Route 1, The Generals Highway, Project 1-D2, Grading, Sequoia National Park, Tulare County, California, 1932* (San Francisco, CA: Bureau of Public Roads, 1932), 1-10.

⁶⁰ Idem, *Final Construction Report on Little Baldy Section of the Generals Highway, Sequoia Park Project 1-D3, Sequoia National Park, Tulare County, California, 1932-1933* (San Francisco, CA: Bureau of Public Roads, 1933), 1-12.

the 1932 Forest Highway Standard. Gist and Bell of Arcadia, California, was awarded the contract and began work in November 1932. Two culverts were constructed underneath the road at Cabin and Dorst creeks. Both were constructed of steel and concrete arches on concrete footings with masonry headwalls.⁶¹

The construction did not end in Sequoia National Park, but extended through the Sequoia National Forest north to General Grant National Park. The first section of road north of the park's northern boundary to a one-half mile north of Big Baldy Ridge was graded in 1932. This 6.7-mile section was constructed in accordance with the 1929 Forest Highway Standard by the Nevada Contracting Company of Fallon, Nevada. The extension of the highway to the General Grant Tree continued with the construction of the section to a point half mile north of Quail Flat. The 3.3-mile section was completed in July 1934. The final section of the Generals Highway was finished in June 1935 when the road reached the southern boundary of General Grant National Park.

With the highway construction completed in Sequoia, the BPR turned to the placement of a bituminous or asphalt treatment on the road. Until this point, most of the highway had been surfaced with crushed granite and oiled periodically to control dust. Bituminous surfacing would provide a more permanent road finish. In 1934, the section from Suwanee Creek to Quail Flat within Sequoia National Forest was given a 1" bituminous treatment on top of the existing surface.⁶² The same year bituminous treatment was placed on the highway from Giant Forest to Suwanee Creek by Hemstreet and Bell of Marysville, California. This contract included a 4" bottom layer of slurry mix and a 3" top layer of bit plant mix, followed by a seal coat of asphaltic oil.⁶³ In 1936, the section from Suwanee Creek to Quail Flat was resurfaced by Frederickson and Watson Construction Company, Frederickson Brothers, and Jones and King of Oakland, California.

⁶¹ The Dorst Creek culvert was reconstructed in 1938 after it was washed out in December 1937 from the headwaters of a flood of the Kaweah River. The reconstruction work was done by Civilian Conservation Corps men from August to November of 1938, according to plans prepared by the Bureau office. The concrete arch culvert was reconstructed following the original design, replacing sections of the footings and headwall, with a new concrete arch costing \$25,939.06.

⁶² B. H. McCain, Assistant Highway Engineer, Bureau of Public Roads, *Final Construction Report on Bituminous Surface Treatment Sections D3 and D4 of the Generals Highway, Sequoia National Park and Sections A and Portion B of the General Grant - Sequoia Park Approach Road, Seq. NR 1-D3, D4 and NR G.G. S.P.A.R., Sec. A and Port. B, Tulare County, California* (San Francisco, CA: Bureau of Public Roads, 1935).

⁶³ Idem, *Final Construction Report on the Bituminous Treated Base Course, Sections C1, D2, D1, and D2, The Generals Highway, Sequoia National Park, Sequoia NR 1-C1, C2, D1 and D2, Bituminous Treated Base Course, Tulare County, California* (San Francisco, CA: Bureau of Public Roads, 1934).

The previous light application of bituminous surface treatment was replaced with a 2-3" bottom layer, a top layer of crushed gravel plant mix, and a seal coat of asphalt.⁶⁴

The remaining sections of the Generals Highway were surfaced between 1937 and 1939 under two contracts. The treatment of the highway from the Ash Mountain entrance to Deer Ridge was done by the Independent Construction Company Ltd., of Oakland, California in 1937-38. The surfacing of 12.5 miles of road cost about \$9,811 per mile and was completed on 16 July 1938.⁶⁵ The last section of unpaved road within Sequoia, from Deer Ridge to the northwest park boundary, was surfaced the following year by Hemstreet and Bell. At the time of surfacing, some curves on the Giant Forest to Lodgepole section were widened. The surfacing of this section for about 20 miles had a final cost of \$183,086.89.⁶⁶

COMPLETION AND DEDICATION OF THE GENERALS HIGHWAY

Official dedication ceremonies for the northern section of the Generals Highway to General Grant National Park took place at the Clover Creek Bridge on 23 June 1935. The press bulletin released for the dedication enthused:

Eagerly awaited by officials and public alike, the occasion will be an outstanding history-making episode as it will mark the attainment of a long sought goal by park officials -- that of a connecting the two Big Tree Parks with an easy grade, modern mountain highway; and at a cost of 2 1/4 million dollars an unbroken circle tour of outstanding scenic splendor has been provided through both National Parks.⁶⁷

The completed Generals Highway was promoted in the same press

⁶⁴ Idem, *Final Construction Report on the Bituminous Treated Base Course Sections D3 and D4 of the Generals Highway, Sequoia National Park and Section A and Portion of Section B of the General Grant - Sequoia Park Approach Road, Sequoia NR 1-D3, D4, and NR GG-S.P.A.R., Sec. A and Portion Sec. B, Bit Treated Base Course, Tulare County, California* (San Francisco, CA: Bureau of Public Roads, 1936).

⁶⁵ Dan B. Munn, Principal Engineering Inspection Superintendent, Bureau of Public Roads, *Final Construction Report, Bituminous Surfacing Sections A1, A2, B (Portion), Route 1, The Generals Highway, Sequoia National Park, Tulare County, California, 1938* (San Francisco, CA: Bureau of Public Roads, 1938), 1-11.

⁶⁶ V. G. Watson, Associate Highway Engineer, Bureau of Public Roads, *Final Construction Report Route 1, The Generals Highway, Project 1-B (Portion), C1, C2, D1, D2, D3 and D4, Bituminous Surfacing, Sequoia National Park, Tulare County, California, 1939* (San Francisco, CA: Bureau of Public Roads, 1939), 1-8.

⁶⁷ Press bulletin, 23 June 1935, 180-22. (SEKI Archives).

release as "America"s Most Beautiful Drive."

A pamphlet produced by the park announced that total highway construction costs within Sequoia National Park had totalled \$1,646,650--\$613,900 for the 16.7 miles between Ash Mountain and Giant Forest with an additional \$91,000 for the surfacing, and from Giant Forest to the northern Park boundary, 15.7 miles, \$836,750 and \$105,000 for surfacing.⁶⁸

ROAD DESIGN AND CHARACTER

The Generals Highway, as designed, was a purposely rustic road following guidelines established and advocated by NPS landscape architects. During the planning and construction phases of the project, attention was taken to showcase and protect both the natural and cultural features of the park. Half a century later, the visitor often does not realize the amount of planning required during road design to produce the road that seems now to integrate so effortlessly into its surrounding landscape.

Original construction of the Generals Highway after 1927 was under the guidance of park landscape architects Merel Sager and later Harold G. Fowler, accompanied by a supporting landscape architectural staff in San Francisco. On site, the landscape architects minimized alterations to the landscape by reviewing the location of the road, selecting the least damaging sites for quarries, borrow pits, and construction camps, monitoring the disposal of rock and other fill materials, and restricting burning of removed trees within the park. When disturbance was unavoidable, the landscape architects sought to limit disturbance to areas that could be easily restored or which were out of view from the roadway.

Although construction of the road was carefully controlled, scars on the landscape were inevitable. The mitigation of these scars began with the rounding of cut slopes, followed with revegetation using native plants, often from the Ash Mountain nursery. The revegetation of slopes also lessened the large number of earth slides on the highway. The roadside through the process of revegetation regained a natural visual appearance.

A number of scenic vistas along the road were planned design elements. Landscape architects approved the path of the road to provide a route with captivating views of the surrounding landscape, offering vistas of the Middle Fork River and Canyon, the Great Western Divide, Moro Rock, and Castle Rocks. In some areas the view was obtained through a planned cutting of

⁶⁸ Pamphlet, "Dedication of Generals Highway--1935." (SEKI Archives).

vegetation in order to open up scenic vista. Turnouts constructed at Amphitheater Point and Deer Ridge offered motorists the opportunity to stop at spectacular views.

Scenic vistas and natural elements were not the only roadside features considered in the design of the highway; cultural components were also important resources on the Generals Highway. Hospital Rock interpretive turnout, located about five miles from Tunnel Rock, was a site of the Potwisha band of Monache tribe. A large granite rock at the site had been used as a shelter by the Potwisha, as well as some of the first explorers of the area. (The rock had been named "Hospital Rock" following its use as a shelter for an injured man.) The site contained pictographs on the rock from a period prior to the Potwisha habitation of the area and grinding holes adjacent to the rock used by the Potwisha tribe for the grinding of acorns. Site development of Hospital Rock for park visitors was largely completed by the Civilian Conservation Corps. Enrollees built a granite slab stairway, replacing earlier wooden stairs, to the top of the rock in order for visitors to see the pictographs, an automobile watering station, a parking lot and campground, and a stone drinking fountain patterned after the grinding holes. Large boulders or "border stones" were installed around the parking area to restrict automobile parking.⁶⁹

Tunnel Rock, located about one mile from Ash Mountain Headquarters, was another roadside feature contributing to the unique character of the Generals Highway. The giant granite boulder was excavated to allow the road to pass beneath it, with a minimum opening of 7' 9". The original wagon road built by the Mount Whitney Power Company had avoided the rock by traveling around it, using the same route as the present day by-pass. CCC enrollees excavated the passage beneath the rock in 1934, and in 1938, constructed masonry support walls on the passage's interior. The CCC also constructed masonry stairs to the top of the boulder and revegetated the entire area.

The "Four Guardsmen," or "Four Guardians," as they were often called in the 1930s, were a natural feature of the forest that were integrated into the highway as part of the construction of the Giant Forest road in 1903. The four Sequoia trees growing close together in a straight line were discovered and named by George Welsh, the original surveyor for that section of road. From the beginning the four large trees served as a defining

⁶⁹Harlan D. Unrau, Historian, Western Team, Denver Service Center, National Park Service, "Historical Overview and Assessment of Civilian Conservation Corps Rock Work along Generals Highway from Ash Mountain to Giant Forest in Sequoia National Park" (Denver, CO: National Park Service, August 1988), 56. Hospital Rock was listed in the National Register of Historic Places on 29 September 1977.

gateway to the Giant Forest and its Big Trees. Originally, a single lane road had been designed to pass between two of the trees, and even as traffic shifted from an occasional horse and buggy to bumper to bumper automobiles, this single lane obstruction remained. Finally, in 1938, a second lane was constructed by the Civilian Conservation Corps. Although the single lane section of road had long constituted a bottleneck to traffic, construction of the second lane had been forbidden by Superintendent White during his long term as superintendent, and it was not until Eivind Scoyen replaced White as superintendent that the construction of the second lane was permitted.

The planned roadside features of the Generals Highway were accompanied by the design and construction of special drainage features, bridges, culverts, signs, guard walls and retaining walls, all constructed mostly from native materials found within the park. The rockwork was unique because the stone used for construction corresponded with the native stone of the area. In zones underlain primarily with schist, schist was the stone used for construction, and in areas of granite, granite was used. This sensitivity to the geological environment allowed the stone to blend in rather than stand out

CCC crews did the improvements at five roadside springs (Big Fern, Granite, Slide, Moss and Wall springs) to provide watering stations for visitors and their automobiles. Another watering station was constructed at Black Oak Corner, a quarter-mile above Big Spring. Other CCC work included slope stabilization, roadside cleanup, and widening of the stone gutters on the Ash Mountain section.⁷⁰

Several types of guard walls and retaining walls were located on the Generals Highway, representing various eras of construction and improvement. The masonry guard walls of schist or granite were constructed in the 1930s and early 1940s.⁷¹ These guard walls varied in form from mortared stone walls 2' high, to rubble masonry wall of dry-laid granite or schist, to sections of individual granite boulders aligned along the road's edge. Rubble schist guard walls were constructed extensively in the area between Ash Mountain and Giant Forest; these were necessitated by the road's dangerous curves and drop-offs. At Deer Ridge, park workers built a distinctive crenelated rubble schist wall, not repeated on any other section of the highway. This crenelated wall was typical of BPR design at this time, and

⁷⁰Unrau, 59-62.

⁷¹ Archival sources describe guardrails being constructed by day labor, Civilian Conservation Corps, and Civilian Public Service men largely during the 1930s and early 1940s.

evidence of this type of wall can be seen in many other western parks with roads of the same period.

Additional rock work in Sequoia included stone gutters of local schist between the southern park entrance and the Ash Mountain Headquarters, a distance of about one mile. The gutters, built by the Civilian Conservation Corps in 1936, were placed on both sides of the road to limit erosion of road fills in the area.⁷² Flat schist rocks with a cement mortar bond were used for the gutter paving, which had a width of 30" and a depth of 3". The inner edge of the gutters served as a border to the road edge, while the back warped and flared to carry off the water. These gutters delivered water to matching stone culverts and drop culverts in this section.⁷³

Numerous culverts were required along the entire length of the highway to convey mountain waters beneath the road. The majority of the culverts visible from the roadway were faced with masonry, blending with and adding to the rustic appearance of the highway. Several double culverts were located in the switchback section, where the road crossed a streambed twice in quick succession; the visible portions of these double culverts were built to match each other closely.

The three bridges on the Sequoia National Park portion of the Generals Highway were built to reflect the rustic character of the Park. The Lodgepole and Clover Creek bridges [HAER Nos. CA-140A and CA-140B), located north of Giant Forest Village, were good examples of the Park Service rustic aesthetic. The bridges featured reinforced concrete arches, with self-supporting stone masonry spandrel walls. Both bridges presented the appearance of true stone arches, thus masking the modern construction method. The bridges used both design and construction methods developed by Park Service landscape architects and utilized in bridge designs in Acadia, Mount Rainier, Yosemite and Glacier national parks. The third bridge on the highway was located at Potwisha, where an exaggerated wooden rustic bridge built in 1936 spanned the Marble Fork. After flood damaged in 1967, the wooden bridge was replaced by a concrete and steel structure in 1970.

⁷² The stone gutters were almost removed in 1938, two years after their construction, when the section of the highway was being paved. The retention of the gutters had been overlooked by BPR engineers in the specifications for the bituminous asphalt treatment of the section of road, and Superintendent White brought the gutters to the attention of the project engineers. (White to C. H. Sweetser, District Engineer, Bureau of Public Roads, 18 March 1938. SEKI Archives).

⁷³ Unrau, 61.

Retaining walls built of stone or wooden cribbing were also constructed in conjunction with the highway. Earth slides and erosion problems were continuous on the highway especially following winter storms, and retaining walls were built to control this problem. The original redwood timber cribbing used to hold the road in place were eventually replaced by weathering steel crib walls in the late 1960s.

Guardrails of many types were used extensively along the Generals Highway. Historically, a wood post and cable guardrail was used on many sections of the road; over time these were replaced by three types of metal guardrails: painted galvanized steel C-rails, and later, weathered steel W-rails and painted galvanized W-rails. All the guardrails had either a rust color due to weathering or were painted reddish brown to blend with the surrounding landscape. In the lower sections of the road the guardrails blended with the surrounding outcrops of schist, but in the upper sections, where granite outcrops were common, the color was more obtrusive.

Automobile watering stations were located along the Generals Highway for park visitors to fill their car radiators. Two types of stations were constructed by the Civilian Conservation Corps. The first type, located both at Ash Mountain Headquarters and at Hospital Rock, were hand-adzed redwood posts with wrought iron bands and hooks for hoses. (Of the stations of this design, only Hospital Rock remains). The second type of watering station involved the development of springs between Hospital Rock and Giant Forest, also by the CCC. These watering stations sought a natural appearance through the use of corresponding stonework, Big Fern Spring, for example, was developed for use in summer 1935. The spring was improved for human use by bringing the water down to the road from its remote source to a place where parking spaces could be provided and by constructing a rock basin and dry-laid rock wall from which water flowed from a concealed pipe.⁷⁴

The rustic character of the Generals Highway was strongly reinforced by the style of signs that were developed for the road. The most distinctive of these rustic signs was the Ash Mountain entrance sign, commonly referred to as the "Indian Head" sign.⁷⁵ This sign was actually the third entrance sign at the southern boundary of the Park. The original sign was a simple

⁷⁴ Harold Fowler, "Report to the Deputy Chief Architect through the Superintendent, Sequoia National Park, California, Seasonal Report - 5th Enrollment Period, April 1, 1935 - October 1, 1935," 6. (SEKI Archives).

⁷⁵ The Ash Mountain entrance "Indian Head sign," was listed in the National Register of Historic Places on 26 April 1978.

wooden rectangular sign carved to read "Sequoia National Park." A second sign, designed in 1931 by NPS landscape architect Merel S. Sager, was a small redwood sign featuring the profile of the Cherokee "Sequoyah," for whom the Big Trees were named. In 1935, resident landscape architect Harold G. Fowler redesigned the sign to a larger scale, maintaining Sager's original concept, and it was carved by CCC enlistee George W. Muno from Arkansas, who modeled his Cherokee face after the profile on the Indian Head nickel. [The sign shows an Indian in a plains-style headdress; the Cherokee actually wore turbans.] CCC crews also prepared the 4' diameter log pylon and massive masonry for the base, and the 15' tall sign was installed during the winter of 1935-36. (The sign was moved from its original location in 1964, with the construction of a new checking station, and now stands about 1/4 mile inside the park's southern boundary).

The northern park boundary entrance sign was also carved by the CCC from a Sequoia slab, and was completed in July 1937. The loosely rectangular sign extended from the simulated trunk of a tree with a branch holding the sign in place. The massive sign measured 1' x 4' x 13'; text was carved into the wood with letters up to 11" high reading "Sequoia National Park."

Park landscape architects were also concerned with the design of buildings located in association with the new road. The early entrance stations at the park's southern boundary illustrate this concern. Construction of the first station, in 1927, followed the completion of the Generals Highway. This simple wood frame cabin soon deteriorated, and was "not agreeable to the landscape architects."⁷⁶ Plans for a new station were drawn by resident park landscape architect Harold G. Fowler, and the construction was completed by the CCC in May 1934. The station design was rustic, using natural construction elements. The rock and stone structure had a lower portion of stone, using shale from within the park, glass walls and heavy timber for exposed framing. Rock curbing surrounded the entire structure with plantings of native shrubs.⁷⁷ The building was replaced in the 1960s by a modern steel structure.

CIVILIAN CONSERVATION CORPS CONTRIBUTIONS

The importance of the Civilian Conservation Corps to the Generals Highway project requires that some background be provided on this extremely important program. The Civilian Conservation Corps [CCC], a program of the Emergency Conservation Work Act, was one

⁷⁶ "Final Report CWA, May 9, 1934," in report from Superintendent White to Cammerer. (SEKI Archives).

⁷⁷ *Ibid.*

of the New Deal programs initiated by President Franklin D. Roosevelt in 1933. The Civilian Conservation Corps was initiated to provide work for unemployed young men working with federal agencies, including the Departments of Interior, War, Agriculture, and Labor, and providing for the revitalization of natural resources. The CCC enlisted unmarried men between the ages of 18 and 25 for a period of six months, and by 1942, the program had hired over 2 million men.⁷⁸ CCC camps were established in most states and many projects included work in state and national parks.

The Civilian Conservation Corps camps within the national parks played an important role in park development that would not have been possible without the program's funding and manpower. The camps participated in areas such as fire management, insect and fungus control, recreation development, historical and archeological projects, and road maintenance. From 1933 to 1942, the national parks and monuments were host to 198 CCC camps.⁷⁹ Park superintendents formulated and submitted work programs outlining proposed projects to the Director of the CCC for approval. Upon project acceptance the superintendent would assign a camp supervisor and administer the entire program within the park. Historian John C. Paige summarized the significance of the CCC to the national parks: "The extensive development and park expansion made possible by the CCC was in large part responsible for the modern national and state park systems."⁸⁰

In Sequoia National Park ten established camps participated in one or more six-month work periods between 1933 and 1942. The camps in Sequoia were Potwisha Camp NO-1, Marble Fork Camp NO-2, Wolverton Creek Camp NO-3, Atwell Mill Camp NO-4, Yucca Creek Camp NO-5, Schreiber's Flat Camp NO-6, Cain Flat NO-7, Ash Mountain Camp NO-8, Buckeye Camp NO-9, Salt Creek Camp NO-10. On 1 May 1933, the first detachment of supervising army officers and CCC enrollees arrived at Potwisha Camp and within two months five camps were established in Sequoia with 35 army officers, 60 park supervisors, and 1,096 enrolled men. Superintendent White placed Forester Been in charge of monitoring the camps for the Park. The camps established in Sequoia were located in the both the foothills and the Giant Forest area, with the camps at higher elevations in the summer months moved to lower elevations during the winter. The CCC carried out many improvements relating to

⁷⁸ Unrau, 56.

⁷⁹ John C. Paige, *The Civilian Conservation Corps and the National Park Service, 1933-1942: An Administrative History* (Washington D.C.: National Park Service, 1985), 132.

⁸⁰ *Ibid.*

the appearance and function of the Generals Highway. Enrollees removed fallen trees and boulders from the road, especially in the spring after the winter storms, and minimized construction scars on the landscape, including sawed stumps, rocks, and debris. Cuts in the mountain side and large boulders hanging over the roadway were eliminated by rounding the slopes to exhibit a more natural appearance. A plant nursery, staffed by enrollees, was established at the Ash Mountain Headquarters, and slopes along the highway were replanted with native species to eliminate construction scars and erosion problems. The CCC was also involved in the widening of the roadway and curves along many portions of the highway. In January 1938 the CCC completed the widening of the road from Ash Mountain to Deer Ridge to a minimum width of 22' throughout.⁸¹ The CCC also helped regular park crews installing guardrails along many sections of the highway.

Other projects undertaken by the CCC included a large amount of stone work located on the Generals Highway including gutters, culverts, guard walls, and retaining walls. Storm damage also brought out the young men of the corps to replace culverts that failed in the weather. Two of the culverts replaced included the Elk Creek culvert in 1935 and the Dorst Creek culvert in 1938.

The contributions of the young men of the Civilian Conservation Corps allowed the park to not only upgrade and improve road conditions, but to superimpose on the Generals Highway a unique natural and rustic character. The work of the CCC remains highly visible when one travels the highway and these elements should be retained as a defining feature of the road's character. The retention of the stone gutters, hand-carved signs, stone guard walls, and watering stations will allow for these elements to continue to contribute to the character of this very special road.

CIVILIAN PUBLIC SERVICE

The last CCC camp closed in Sequoia Park in July 1942, but the park improvement work was not halted. A group known as the Civilian Public Service (CPS) came to work in the park. These men, largely Mennonites, were conscientious objectors to World War II and served their country by working in the national parks. The first CPS camp was established in Sequoia in May 1942, and camps operated in the park until the end of the war. The men performed similar types of construction and maintenance work to that the CCC had done the previous decade. Highway maintenance by the CPS included the building of retaining walls, culverts,

⁸¹ Superintendent's Monthly Report, January 1938. (SEKI Archives).

headwalls, and gutters. Guard walls constructed by the CPS included the curb wall at Deer Ridge and a 225' solid rock parapet at Amphitheater Point. The CPS also continued landscaping efforts and bank stabilization along the highway. The work of the CPS during World War II extended and largely completed what the CCC had begun in the 1930s.

CONCLUSION

The Generals Highway is a unique and valuable asset to Sequoia National Park. Since 1926, this historic road has served as the main access to the Giant Forest and the only vehicle route through the park. Driving the Generals Highway is an important part of the visitor experience in Sequoia. Like many roads in many of the other national parks, the highway's character is defined by its seemingly effortless integration with the surrounding landscape. Park Service planners mandated the construction of a road that would be respectful of the natural and cultural resources of the park, thus requiring considerable care in its layout and construction.

It is imperative for the Generals Highway to be retained in both principle and design as a rustic park road. The rustic character of the Generals Highway lies within the sum of the parts, for it is the switchbacks and road design, the stone guard walls, the stone gutters, the hand-carved signs, the Four Guardsmen, Tunnel Rock, Hospital Rock, the watering stations, and the scenic vistas that together create the rustic driving experience. As modern design standards are applied to this highway the historic elements of the road should not be overlooked if the character and experience of the Generals Highway is to remain intact for future generations.

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ADDENDUM TO
GENERALS HIGHWAY — Sequoia National Park Roads & Bridges
Between Ash Mountain Entrance, Giant Forest and General Grant Grove
~~Giant Forest Vicinity~~ Three Rivers Vicinity
Tulare County
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Tulare County
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HAER No. CA-140 p. 41

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Further research has shown that Pumpkin Hollow Bridge was actually constructed in 1922, not 1924 as indicated on drawing 9.

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California Department of Transportation, Caltrans Structure Maintenance and Investigation, Historical Significance-State Bridges (October 1, 2001), p. 304.